Review for Test #1 over Ch 1

Work all the problems on a separate piece of paper showing all steps.

Define each of the following:

1) a) Natural Numbers b) Whole Numbers
c) Integers d) Rational Numbers
e) Irrational Numbers f) Real Numbers

Name the property of real numbers being used in the following:

2) a) $7 + (x + 11) = (7 + x) + 11$ b) $7 + (x + 11) = 7 + (11 + x)$
c) $7 + (-7) = 0$ d) $T \bullet 9 = 9 \bullet T$
e) $5 \bullet 1 = 5$ f) $8(-3x) = (8(-3))x$
g) $\frac{4}{5} \bullet \frac{5}{4} = 1$ h) $9x + 0 = 9x$

Simplify the following:

3) $-13.6 + 4.5 - (-6.7)$
4) $-48 - 3(-20)$
5) $-9\frac{2}{9} - 5\frac{1}{6} + (-2\frac{5}{12})$
6) $-(-6) + 34 - 11 + (-54)$
7) $-9.2(2.4) \div (-8)(-0.2)$
8) $-24 \div (-\sqrt{4(25) - 6^2})(3)$
9) $5\frac{3}{4} \div (-3\frac{2}{7})$
10) $-5\frac{1}{7} \bullet (2\frac{5}{8}) \bullet \frac{3}{14} \bullet (-2)$
11) $12 \bullet (-2)^3 \div (-4) \bullet (-3) - 21$
12) $[9.1 - (6.1 - 7.5)] - 4^2$
13) $-9(-7) \div 0$
14) $9(-15)(\frac{4}{5})(0)$
15) $\frac{17 - \sqrt{196 - 4(13)} + 7(-4)}{-3^2}$
16) $-\frac{13}{32} - \frac{4}{7}\left[\frac{3}{8} + \frac{1}{2}\right]^2$
17) $-\left|-9\right| - (-7) - \left|-8 - (-7)\right|$
18) $\frac{-6 - (-2)^2}{-8 - 6 + (-1)}$

Translate the following into an expression and then simplify:

19a) The product of – 4.1 and 1.4.

19b) The difference of $\frac{2}{3}$ and $-\frac{9}{5}$.

20a) 6 less the quotient of 10 and 5.

20b) 4 less than the product of 8 and 3.

Compare the following using <, >, or =:

21a) – 8 6

21b) – 5 $-\sqrt{49}$

22a) $-\left|-13\right|$ 56 – 3(23)

22b) – (– 5 – 6) $-(-4^2-5)$

Evaluate the following for x = – 4, w = – 3, T = – 1/3, and d = 5:

23a) $x^2 - w - d^3$

23b) $\frac{-x-w+d}{xwT}$

24a) $\frac{d}{w} - T$

24b) $-x-w-\sqrt{3d+10}$

Evaluate the following:

25a) Use the formula $F = \frac{9}{5}C + 32^\circ$ to convert – 35° Celsius to Fahrenheit.

25b) A tree requires 180 square feet to grow properly. What is the maximum number of trees that a yard measuring 73 feet by 120 feet can support? (hint: A = LW)

Using x to represent "a number," translate the following into a variable expression (Do not simplify):

26a) Twice a number subtract eight.

26b) Three times the difference between the product of two and a number and 7.

27a) The total of 3 and a number, subtracted from 7 times a number.

27b) The quotient of a number and the sum of negative seven and three times a number.

28a) Twice the number squared subtracted from 14.

28b) The difference of a number cubed and twice the number.

Simplify the following:

29) $5(2x - 3)$

30) $-7(3x + 2y - 4z)$

31) $\frac{2}{3}(4x - 18) + 16$

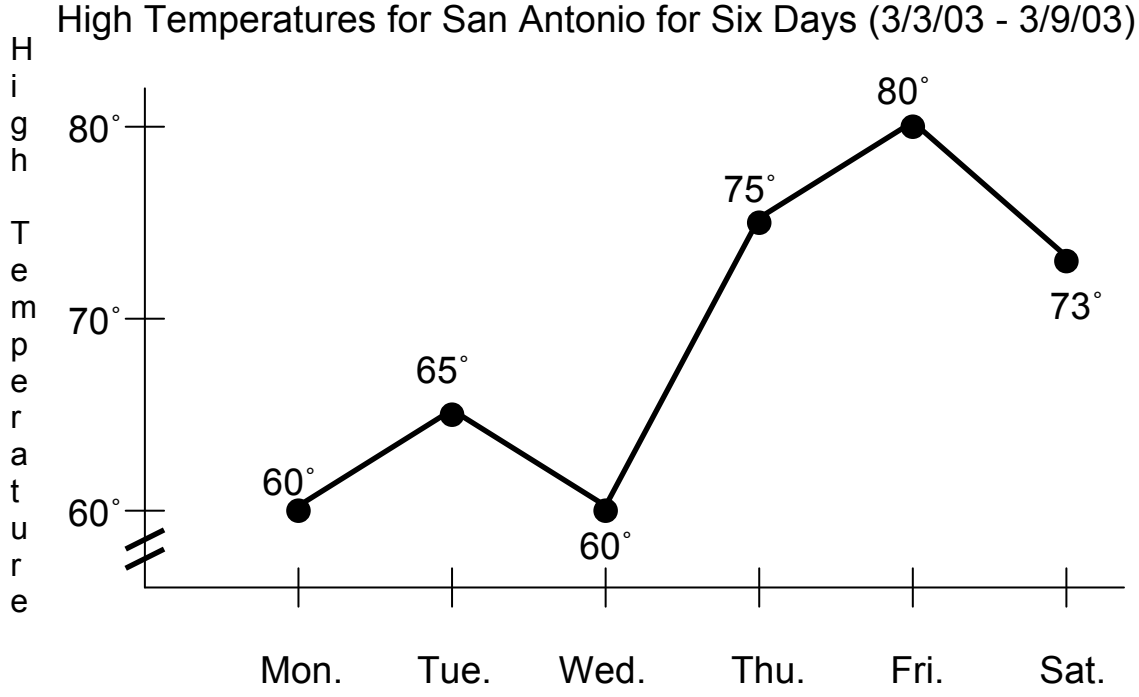
32) $3(4x - 5) - 2(7x - 9) - 11$

33) $3.2x^2 - 6x + 5.4 - 8.1x^2 + 15x - 9$

Plot the following numbers on a number line:

34) -4, 3, 0.75, -1.25, $\frac{5}{3}$, $-\frac{13}{5}$, and $\sqrt{5}$

Use the chart below to answer the following:



35a) Find the average high temperature over the six-day period.

35b) How many days was the temperature greater than 65˚?

In the problem below, the student has made an error. Use critical thinking to find and correct the error. Then finish working the problem.

36) Simplify: $3.4(5x) - 1.6(8 + 2x)$

Solution:

$3.4(5x) - 1.6(8 + 2x)$

$= 17x - 12.8 + 3.2x$

$= 20.2x - 12.8$

37) Evaluate $-x - y^2z$ for $x = -2$, $y = -3$ and $z = 4$

Solution:

$-x - y^2z = -2 - (-3)^2(4)$

$= -2 - (9)(4)$

$= -2 - 36 = -38$

38) Simplify: $\left(-6\frac{2}{3}\right)\left(2\frac{5}{8}\right)$

Solution:

$\left(-6\frac{2}{3}\right)\left(2\frac{5}{8}\right)$

$= -12\frac{10}{24}$

$= -12\frac{5}{12}$

39) Convert $\frac{5}{16}$ to a decimal.

Solution:

$$\begin{array}{r} 3.2 \\ 5 \overline{)\ 16} \\ -\ 15 \\ \hline 10 \\ -\ 10 \\ \hline 0 \end{array}$$

So, $\frac{5}{16} = 3.2$

40) Translate "The product of negative four and a number subtracted from twenty-three," into a variable expression.

Solution:

$-4x - 23$

If a and b are positive proper fractions, use critical thinking to determine which of the statements are always true, sometimes true, or never true.

41) a) $a \bullet b$ is a proper fraction.

b) $a + b$ is an improper fraction.

c) $a - b$ is a proper fraction.

d) $1 \div b$ is a proper fraction.

e) $a \div b$ is a proper fraction.

If a and b are negative numbers, use critical thinking to determine which of the statements are always true, sometimes true, or never true.

42) a) $a \bullet b$ is positive.
b) $a + b$ is positive.
c) $a - b$ is positive.
d) $a \div b$ is negative.
e) $-a - b$ is positive.

Use critical thinking to fill in the blank with either "All," "Some," or "No" to make the statement true:

43) a) _____ Natural Numbers are Rational Numbers.
b) _____ Integers are Irrational Numbers.
c) _____ Rational Numbers are Whole Numbers.
d) _____ Irrational Numbers are Real Numbers.
e) _____ Whole Numbers are Natural Numbers.

Without working the problem, use critical thinking to determine which answers are *unreasonable*:

44) $(-3.\#) \div (-7.\#)$

a) ≈ -1.74 b) ≈ 0.578 c) ≈ 1.74 d) ≈ -0.562 e) ≈ 0.562

45) The average of $-4.\#$, $3.\#$, $-5.\#$, -0.3, $1.\#$, -2.1, and $6.\#$.

a) 0.4 b) -7 c) -0.4 d) -6.7 e) 8.9

Answers:

1) a) $\{ 1, 2, 3, 4, \ldots \}$ b) $\{ 0, 1, 2, 3, 4, \ldots \}$ c) $\{ \ldots, -3, -2, -1, 0, 1, 2, 3, \ldots \}$

1) d) $\left\{ \frac{a}{b} \mid a \text{ and } b \text{ are integers and } b \neq 0 \right\}$

1) e) $\{ a \mid a \text{ is a non-terminating, non-repeating decimal} \}$

1) f) $\{ a \mid a \text{ is either a rational or irrational number} \}$

2) a) Associative Property of Addition b) Commutative Property of Addition

2) c) Inverse Property of Addition d) Commutative Property of Multiplication

2) e) Identity Property of Multiplication f) Associative Property of Multiplication

2) g) Inverse Property of Multiplication h) Identity Property of Addition

3) -2.4 4) 12 5) $-16\frac{29}{36}$ 6) -25 7) -0.552 8) 9 9) $-1\frac{3}{4}$ 10) $5\frac{11}{14}$

11) -93 12) -5.5 13) undefined 14) 0 15) $\frac{23}{9}$ 16) $-\frac{27}{32}$ 17) -3

18) $\frac{2}{3}$ 19a) $-4.1 \bullet 1.4$; -5.74 19b) $\frac{2}{3} - \left(-\frac{9}{5}\right)$; $\frac{37}{15}$ 20a) $6 - 10 \div 5$; 4

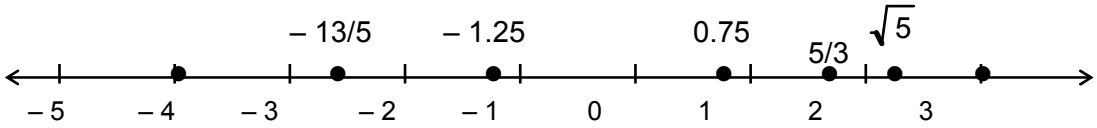
20b) $8 \bullet 3 - 4$; 20 21a) < 21b) > 22a) = 22b) < 23a) -106 23b) -3

24a) $-\frac{4}{3}$ 24b) 2 25a) -31° C 25b) $\approx$ 48 trees (round down) 26a) $2x - 8$

26b) $3(2x - 7)$ 27a) $7x - (3 + x)$ 27b) $x \div (-7 + 3x)$ 28a) $14 - 2x^2$ 28b) $x^3 - 2x$

29) $10x - 15$ 30) $-21x - 14y + 28z$ 31) $\frac{8}{3}x + 4$ 32) $-2x - 8$ 33) $-4.9x^2 + 9x - 3.6$

34)



35a) $68\frac{5}{6}^\circ$ 35b) Three days 36) $13.8x - 12.8$ 37) -34 38) $-17\frac{1}{2}$

39) 0.3125 40) $23 - (-4x)$

41) a) Always b) Sometimes c) Always d) Never e) Sometimes

42) a) Always b) Never c) Sometimes d) Never e) Always

43) a) All b) No c) Some d) All e) Some

44) a, c, d 45) b, d, e